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Understanding User Adoption of AI Chatbots: The Role of Anthropomorphism, Ease of Use, and Perceived Usefulness

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Abstract

Although Artificial Intelligence (AI) based chatbots are increasingly integrated into digital interactions, it is still important to comprehend the elements that influence their acceptance in order to promote long-term adoption. Our current study seeks to explore the impact of Ease of Use (EOU), Perceived Usefulness (PEU), AND Anthropomorphism (ANTH) on Attitude (ATT) of the users and their Intentions to Use (ITU) AI powered chatbots. The research draws on Extended Technology Acceptance Model (ETAM) and Media Theory. The study also looks into how ANTH mediates the interactions between EOU and PEU and ATT and ITU. Data were collected through an online questionnaire from 253 respondents in Karachi, Pakistan. The hypothesized relationships were tested using PLS-SEM. The findings of the study reveal that EOU and PEU have significant positive effects on both ATT and ITU. ANTH was also found to significantly influence ATT and ITU. This highlights that perceptions of human-like characteristics contribute to more favourable evaluations and stronger intentions to use AI-powered chatbots. In addition, ANTH significantly mediates the relationships of EOU and PEU with both ATT and ITU. ATT is also found to positively influence ITU. By merging technological insights with the human-like qualities of AI engagement, this research enhances the comprehension of chatbot usage and underscores ANTH as a crucial factor through which usability and usefulness lead to positive user reactions. The results provide actionable recommendations for developing AI-powered chatbots by stressing the importance of blending intuitive features and perceived benefits with suitable human-like interaction traits.

Keywords: AI Chatbot Adoption, Anthropomorphism, Ease of Use, Perceived Usefulness, Extended Technology Acceptance Model.

1. Introduction

AI and its adoption is playing a significant role in style of living and working of individuals. It is already making a difference in diverse sectors like healthcare, finance, transportation, manufacturing and education. With time, AI is integrating more into our daily lives and decisions. Due to the penetration of AI, it is important to understand what makes people accept and use AI. AI Chatbots have been integrated into different platforms. They are deployed in assisting people as assistants or providing customer support services. These AI chatbots may revolutionize user interactions with technologies, such as Chat GPTs Embedding Topic Model or ETM. These models are capable of understanding and generating like conversations and assisting humans step by step. They do this by analyzing patterns in language and learning from sets of data. The result is a natural and useful interaction, between users and digital systems. Programmed to recognize

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texts, including keywords and phrases related to common customer roadblocks, chatbots interact with individuals to offer solutions based on the information received (Sodré & Duarte, 2023). Many organizations deploy chatbots to provide customer services and technical support (Zhang et al., 2023), reducing the volume of cases typically handled by customer service representatives and allowing employees to focus on more complex concerns (Kolasani, 2023).

Nevertheless, despite their potential benefits, a thorough comprehension of the elements that motivate consumers to interact with chatbots is still in its early stage, impeding their best use and effectiveness (Wang et al., 2023). Even while chatbot technology is becoming more and more popular, there is a lack of thorough study that explores the complex interactions between these variables, particularly when it comes to models that make use of sophisticated frameworks like ETM (Takaki & Dutra, 2023). This lack of information prevents customized approaches to improve user adoption rates and maximize Chat GPT and other chatbot systems' capabilities (Choudhury & Shamszare, 2023).

A number of interrelated factors, including technological complexities, user-centric concerns, and contextual relevance, impact the adoption and continued usage of chatbots (Ayanwale & Ndlovu, 2024). Firstly, the technology component includes the accuracy of the responses, as well as how well it comprehends customer enquiries, provides pertinent answers, and adjusts to various conversational situations (El-Ansari & Beni-Hssane, 2023). User-centric features have a significant impact on chatbot adoption and usage (Silva et al., 2023). These include user preferences, attitudes, and opinions on conversational interfaces. Users' decisions to interact with and persist with these AI-powered systems are heavily influenced by factors such as usability, perceived value, faith in the chatbot's abilities, and engagement pleasure (Maduku et al., 2024). The capacity and ability of chatbots to align with the needs of users and their integration into the routine of users is making a lot of difference and having an impact on it adoption (Jiang et al. 2023).

Users like to give chatbots features that are like humans as shown by the "Media Equation" and "Computers as Social Actors (CASA)" theories that talk about making computers seem like people in human-computer interaction (Laaksonen et al., 2023). This means people see chatbots as creatures give them feelings or think their actions are, like humans. User interface designs which appear to be human have the capacity to make the user very happy and hence provide an enhanced user experience through generating a positive response and desire for continued use of the chatbot. It is vital to understand how designing chatbots to appear has an influence on their usage.

1.1 Research Objectives

In this respect, the present research will focus on finding out those factors which are influencing users to use the AI-based chatbots like ChatGPT and Google Bard. In order to fully comprehend the complex relationships between user motivations, technology-related features, usability issues and contextual significance in relation to the ChatGPT through the framework of ETM, it is the intention of this research to conduct a detailed analysis. The findings from the analysis will help in closing the existing research gaps regarding these complex variables and provide useful insights for designers and developers of chatbots. In this connection, the current research focuses on exploring the following questions:

1. What are the factors influencing user’s Attitude and Intention to use AI?
2. What is the direct and indirect impact of Anthropomorphism on the Attitude and Intention to use AI?

1.3 Significance of the Research

The seeks to examine the complex relationships between anthropomorphism, perceived usefulness, ease of use, and user attitudes and intentions towards AI-based chatbots. With the use of a complete conceptual framework, this research will provide valuable information on the impact that human-like features, along with the advantages of chatbots and their perceived ease of use, can have on attitudes and intentions. Such information is essential for designing and developing better chatbot interfaces to increase the success of artificial intelligence agents used in various online systems, effectiveness of AI-powered conversational agents in various digital platforms.

2. Literature Review

2.1 Media Theory (MT)

MT, which is a part of Communication Studies, looks at interactions between people and media and their perceptions of media and technology. The combination of MT and ETAM in studying consumer acceptance of chatbots, such as ChatGPT, provides great insights into how the media impacts communication processes (Korzynski et al., 2023). MT allows one to see how media impact the social norms and behavior of people and makes it possible to study the patterns of user behavior and how technology influences decisions about chatbot acceptance (Paul et al., 2023). MT allows one to look at the impact of media on communication by studying how the user behavior and communication patterns are impacted by the use of chatbots; that is especially useful in understanding how the AI system gets incorporated into users' daily life (Aggarwal et al., 2023). Also, it is helpful in understanding the interpretation and perception of information by studying how people interpret information provided by the chatbots and judge its use (Wang et al., 2023). Furthermore, MT also looks at the wider impact of the media on user perception and attitude towards interacting with the chatbots, where initial perceptions play an important role in the continuation and acceptance of the use of chatbots (Ma & Huo, 2023). MT also takes into account the cultural dimension of chatbot acceptance. Cultural norms and societal conventions have a significant impact on how people perceive and accept new technologies like chatbots. This perception may vary across demographics and geographic regions (Zhang et al., 2023). Including MT as part of the analysis of the variables influencing the use of ChatGPT gives a wider picture and provides some additional insights apart from technical factors. Such an inclusion enables the study to consider communication patterns and technical behavior of users influenced by the chatbots (Al-Shafei, 2024).

2.2 Extended Technology Acceptance Model (ETAM)

Technology Acceptance Model (TAM) is a basic model that is commonly used in predicting users' acceptance of technologies. First developed by Davis et al. (1989). This model has been validated through various studies. This model is an adaptation of the Theory of Reasoned Action (TRA) that was formulated by Fishbein. According to this model, the acceptance of information technology system of an individual is basically determined by these two concepts (Putranto, 2020). The former indicates that the person believes that the use of the technology will improve his/her job performance, while the latter indicates that the use of the technology will require no effort. Over time, TAM has undergone changes to cope with the model's shortcomings and expand its scope of application. For example, Venkatesh and Davis (2000) came up with TAM2 by including additional factors that explain the reason behind the perceived usefulness at different points in time.

Although TAM is acceptable, there exist some limitations of this model, including inconsistent results in regards to moderators and external variables (Chen & Tan, 2004; Legris et al., 2003). In order to solve these problems, the Extended Technology Acceptance Model (ETAM) was developed. ETAM involves additional socio-psychological factors to constructs to get a broader perspective on technology adoption. The mentioned factors are emotion response, social impact, enablement factors, and cognitive instrumental process (Yap et al., 2022). Through the inclusion of these factors, ETAM allows looking at the process of technology interaction from a different angle, which goes beyond simple factors included into the TAM. In the present study, the concept of anthropomorphism from Media Theory will be incorporated into ease of use and perceived usefulness to investigate the attitudes and intentions to use chatbots. Through the combination of both concepts, the study provides an exhaustive consideration of user adoption and interaction with AI chatbots.

2.3 Hypotheses Development

2.3.1 Perceive Usefulness (PEU)

The Users' Perception of their ability to perform better or make their tasks easier using a particular technology is captured through perceived usefulness, which is an important element of technology adoption models such as the ETAM. (Liu et al., 2018). There have been numerous studies that have found that the intentions and behaviors of consumers towards adopting and using technologies such as ChatGPT bots are greatly affected by their usefulness. These technologies are also useful and beneficial (Choudhury & Shamszare, 2023). People feel good about technology since they feel that the chatbot is giving them the right information at the right time (Eslit, 2023). Positive perception of technology is necessary because it usually results in its usage more often. In addition to that, the research carried out by Enriquez et al. (2024) proves that PEU greatly affects users' willingness to use technology. When users see the value of technologies such as ChatGPT, they have a strong desire to use them. This is especially true for sustained engagement since people who find the tool to be highly useful are more likely to include it into their daily routines and seek help from it (Enriquez et al., 2024). Thus, it can be noted how significant it is to know how consumers evaluate the usefulness and benefits of such technologies as ChatGPT based on the existing body of literature. It means that the evaluations of the usefulness of such tools largely affect consumer attitudes and intentions towards using them (Adams et al., 2023). Hence, the present research aims at studying the following hypotheses:
H1(a): PEU has a significant positive impact on ATT.
H1(b): PEU has a significant positive impact on ITU.

2.3.2 Ease of Use (EOU)

Opinion of users about how simple it is to interact with and use a technology, like chatbots such as ChatGPT, are referred to as perceived EOU, which is a crucial component of the ETAM (Tiwari et al., 2022). ATT and Intention of Users towards utilizing technology are greatly influenced by their PEU, as evidenced by a wealth of research within technology adoption frameworks (Malaeb et al., 2023). A user-friendly UI, simple interactions, and unambiguous communication greatly influence users' views of EOU which in turn influences their adoption decisions. Recent studies have shown that engaging and user-friendly interfaces significantly enhances the acceptance and satisfaction of users, hence encouraging their use.
Additionally, research by Jo (2023) claims that because perceived EOU affects PEU, users' attitudes and behaviors are influenced indirectly by perceived EOU in addition to their intentions to utilize technology. This duality highlights the importance of designing a technology that

performs well and is simultaneously easy to use as users are then likely to perceive it as beneficial and will be more inclined towards its adoption.
The significance of understanding how consumers evaluate the simplicity and user-friendliness of chatbots such as ChatGPT is highlighted by this body of literature. The literature establishes that users' perceptions of EOU significantly affect their ATT and intentions towards adopting and continuously using the technology (Adams et al., 2023). Based on these arguments, this research seeks to examine the following hypotheses:
H2(a): Perceive EOU has a significant positive impact on ATT.
H2(b): Perceive EOU has a significant positive impact on ITU.

2.3.3 Anthropomorphism (ANTH)

ANTH simply means giving human traits, feelings, or actions to things that are not at all humans, like smart computer chatbots such as ChatGPT. In simple terms it is like when we pretend a toy robot can talk, feel happy or act like a real person. Research shows that when computer programs act more like people, it completely changes how we think about them and how much we like talking to them (Pavone,2021).
When computer helpers use warm words, sounds friendly, or act like they have real human emotions, people naturally feels closer to them and enjoy taking helps and talking to them and fell more comfortable (Xie,2023). Because these friendly features make the computer feels familiar and polite, users feel comfortable right away (Wei et al., 2024). However, making a chatbot act like a person can work in wo different ways. Some people thing a supper realistic chatbot is fun and helpful but some people might feel uncomfortable, weird and confused or tricked by it. This can make them loose trust in tool. That’s why while making the chatbot it is very important to keep that in mind that make it seems human but also keep them clear and honest. Understanding how user feel about human like helpers help the creators build better tools that help people happily use every single day (Choudhury & Shamszare, 2023). This understanding is very important to make the user experience better and to indulge the better version of chatbot into people’s daily life.

Based on these arguments, this research seeks to examine the following hypotheses:
H3(a): ANTH has a significant positive impact on ATT.
H3(b): ANTH has a significant positive impact on ITU.
Moreover, ANTH has been shown to mediate the relationship between key factors such as PEU, EOU, and ATTs and Intentions. For instance, Liu et al. (2024) found that ANTH can enhance users' perceptions of the chatbot's usefulness and EOU, which in turn positively impacts their ATT and ITU the chatbot. Additionally, studies have demonstrated that ATT can bridge the gap between EOU and PEU by creating a more engaging and relatable user experience (Özer et al., 2021). Furthermore, this study investigates how ATT mediates the relationships between PEU, PEU, and user attitudes and intentions:
H4(a): ANTH mediates the relationship between PEU and ATT.
H4(b): ANTH mediates the relationship between PEU and ITU.
H4(c): ANTH mediates the relationship between PEU and ATT.
H4(d): ANTH mediates the relationship between PEU and ITU.

2.3.4 Attitude (ATT) and Intention to Use (ITU)

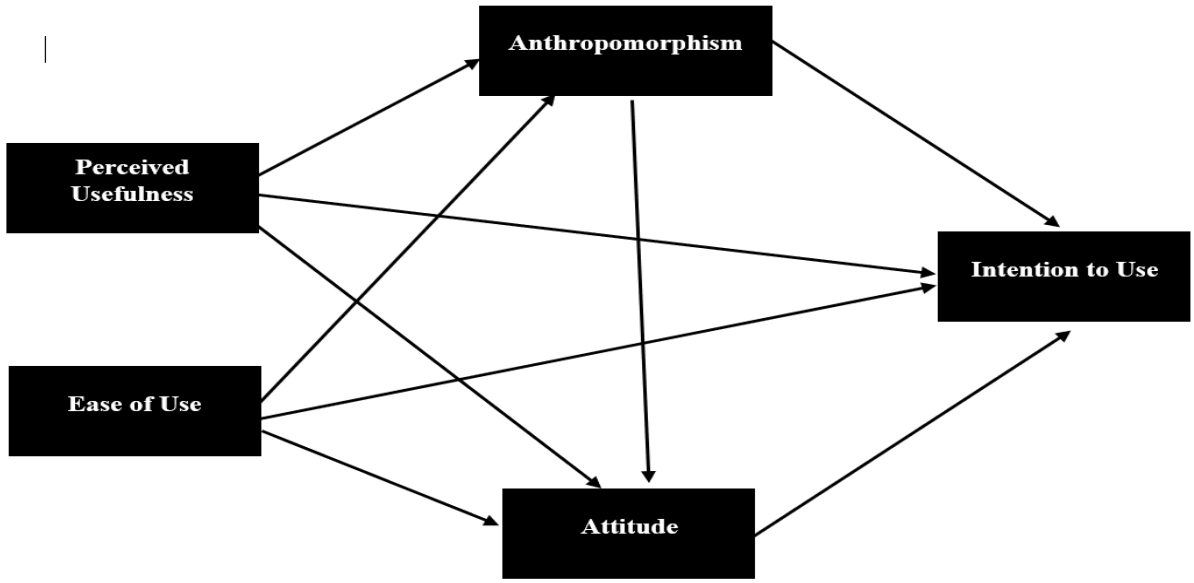
An essential part of the ETAM is the ITU, representing the will and desire of the users to embrace and interact with technology like chatbots, such as ChatGPT. A significant amount of research emphasizes the importance of users' intentions in predicting and anticipating their actual usage patterns (Menon & Shilpa, 2023). Studies by Foroughi et al. (2023) demonstrate that behavioural

intentions are a reliable indicator of actual behaviour, indicating that users' intentions to utilize a technology significantly impact their subsequent actions. The study of Bonsu and Baffour-Koduah (2023) how people feels, how the tool is, and how easy it is to use and understand all the change for those who want to use the technology. Also outside things like friends talking about it, recommendations, and have the right tool available to use also influence the person to use chatbot (Gupta & Yang, 2024). Plus, Xia and Shannon (2024) point out that how well a helper works, especially understanding what people ask them to do and give their best answers, makes people want to use it more.

In ETAM, feelings mean what people think and feel about using new tech like ChatGPT helpers. Research strongly shows that feelings strongly change what people choose to do Xia and Shannon (2024). Study by Yilmaz and Rızvanoğlu (2024) show that people intension to use the technology is very much influenced by how opinions favoured that and show that when people like tech, they want to use it. So, we guess that:

H5: ATT has a significant positive impact on ITU.

Figure 1 Conceptual Framework



3. Methodology

We want to learn why people use helper tools like ChatGPT, so we look at college students and workers who know how to use it and use it in their daily life. We picked Karachi because many high level tech users are from here. Our goal was to talk to at least 250 people so the results we get can be corrected and avoid mistakes (Krejcie & Morgan, 1970). We successfully collected answers from 253 people.

We used survey questionnaire because it is the fastest way to get answers from the large group. We sent the quiz out to the people online using google forms. Almost every question asked people

to pick the rating score from 0 – 5, except the basic question about who they are and what they do. The main thing we measured in this study is whether the AI felt like a real human, how many people felt about it, how easy it was to use, if they planned to keep using it and if it was actually useful to them. The survey items for this study were adapted from established literature. This was done to ensure content validity. For PEU, the items were adapted from (Niu & Mvondo, 2024). For other constructs, namely, EOU, ANTH, ATT and ITU, the items were adapted from (Ahmad et al., 2023), (Yao et al., 2023), (Kim &Lee, 2024) and (An et al., 2023), respectively.
For examining the impact of various factors on chatbot adoption, the research used PLS-SEM. It was selected as an analytical tool due to its value and rigor in analysis (Purwanto, 2021). It also enables a detailed exploration of the mediating effects of ANTH and other complex relationships. The research followed the usual perspective, initially testing the measurement model, followed by the structural model.

4. Analysis

As recommended by Henseler et al. (2014), the measurement model was verified after the data collection. The reliability and validity of the research tool was ensured by the testing for measurement model. First, factor loadings were examined in the model. Loadings less than 0.5 were eliminated from additional analysis in accordance with Hair et al. (2021)'s recommendation. The item ANTH4 was eliminated from this study because its factor loading was less than 0.5. The choice to exclude items with low factor loadings conforms with the requirements in order to ensure that the constructs are assessed accurately. The table below provides specific results.

Table 1 Item Loadings

ITEMS	ANTHROPOMORPHISM (ANTH)	ATTITUDE (ATT)	EASE OF USE (EOU)	INTENTION TO USE (ITU)	PERCEIVE USEFULNESS (PEU)
ANTH1	0.801				
ANTH2	0.587				
ANTH3	0.536				
ANTH5	0.512				
ATT1		0.708			
ATT2		0.724			
ATT3		0.662			
ATT4		0.607			
ATT5		0.688			
EOU1			0.698		
EOU2			0.593		
EOU3			0.624		
EOU4			0.548		
EOU5			0.704		
ITU1				0.656	
ITU2				0.618	
ITU3				0.630	
ITU4				0.750	
PEU1					0.663
PEU2					0.715
PEU3					0.622

PEU4	0.640
PEU5	0.640

Following the confirmation of the item loadings, the validity and reliability of the instrument were evaluated, and discriminant validity was then established. Table 2 demonstrates that every construct associated with chatbot adoption—including ANTH, ATT, EOU, ITU, and PEU—meets the criteria of reliability and validity values. The instrument's reliability is confirmed by Cronbach's alpha and composite reliability scores for all constructs being higher than the accepted cutoff of 0.7. The validity is also confirmed by the Average Variance Extracted (AVE) values for each construct being higher than the minimal criterion of 0.5 (Hair et al., 2012).

Table 2 Reliability and Validity

CONSTRUCT	Cronbach's alpha	Composite reliability	Average variance extracted (AVE)
ANTHROPOMORPHISM	0.701	0.709	0.538
ATTITUDE	0.709	0.810	0.561
EASE OF USE	0.733	0.771	0.505
INTENTION TO USE	0.795	0.759	0.543
PERCEIVE USEFULNESS	0.746	0.792	0.533

The assessment of discriminant validity was done after the reliability and validity assessments. According to Schwab (2013), when different constructs are empirically distinct, discriminant validity is present. The Fornell-Larcker criterion was used to verify the discriminant validity of this study's measurement model. If the square root of each construct's Average Variance Extracted (AVE) is higher than the highest correlation with any other construct, discriminant validity is established. In this study, the correlations between constructs (off-diagonal values) were compared to the square roots of the AVE values (shown on the diagonal). Discriminant validity is confirmed because, as Table 3 illustrates, the square root of the AVE for each construct is higher than its highest correlation with any other construct.

Table 3 Discriminant Validity

CONSTRUCT	ANTH	ATT	EOU	ITU	PEU
ANTHROPOMORPHISM	0.733				
ATTITUDE	0.523	0.750			
EASE OF USE	0.413	0.742	0.710		
INTENTION TO USE	0.409	0.568	0.578	0.737	
PERCEIVE USEFULNESS	0.480	0.632	0.570	0.515	0.730

H1(a) was the strongest relationship observed in the model, indicating that users who perceive AI-powered chatbots as easy to interact with are more likely to develop a favourable attitude towards their use. EOU also positively influenced ITU ($M = 0.423$, $SD = 0.078$, $t = 5.439$, $p < 0.001$),

confirming H1(b). Thus, greater perceived ease in using chatbots is associated with stronger intentions to adopt them. PEU was also found to have a significant impact on ATT and ITU. The significant positive impact on ATT ($M = 0.308$, $SD = 0.058$, $t = 5.342$, $p < 0.001$) supported our H2(a), while the relationship between PEU and ITU was also significant ($M = 0.283$, $SD = 0.078$, $t = 3.508$, $p < 0.001$), hence supporting our H2(b). These results indicate that users are more inclined towards functionality in AI-powered chatbots and they tend to evaluate them more positively and show stronger intentions to use them. The results further established the significance of ANTH in shaping user responses. ANTH had a significant positive relationship with ATT ($M = 0.187$, $SD = 0.044$, $t = 4.335$, $p < 0.001$), thereby supporting H3(a). A positive relationship was also found between ANTH and ITU ($M = 0.135$, $SD = 0.060$, $t = 2.304$, $p = 0.021$), confirming H3(b). These findings suggest that users who perceive greater human-like qualities in chatbot interactions are more likely to develop and demonstrate favourable attitudes and stronger usage intentions. ATT was also positively linked with ITU ($M = 0.175$, $SD = 0.027$, $t = 2.355$, $p = 0.015$), providing support for H5. This indicates that a favourable attitude towards AI-powered chatbots helps in developing willingness of users to use them.

Table 4 Direct Effects

Hypothesis	Relationship	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Result
H1(a)	EASE OF USE -> ATTITUDE	0.571	0.056	10.180	0.000	Accepted
H1(b)	EASE OF USE -> INTENTION TO USE	0.423	0.078	5.439	0.000	Accepted
H2(a)	PERCEIVE USEFULNESS -> ATTITUDE	0.308	0.058	5.342	0.000	Accepted
H2(b)	PERCEIVE USEFULNESS -> INTENTION TO USE	0.283	0.078	3.508	0.000	Accepted
H3(a)	ANTHROPOMORPHISM -> ATTITUDE	0.187	0.044	4.335	0.000	Accepted
H3(b)	ANTHROPOMORPHISM -> INTENTION TO USE	0.135	0.060	2.304	0.021	Accepted
H5	ATTITUDE -> INTENTION TO USE	0.175	0.027	2.355	0.015	Accepted

The mediation analysis studied whether ANTH serves as an intervening mechanism in the relationships of PEU and EOU with ATT and ITU respectively. The results showed that all four proposed indirect effects were statistically significant. H4(a), which hypothesized the mediating role of ANTH between PEU and ATT, was supported ($M = 0.066$, $SD = 0.022$, $t = 3.039$, $p = 0.002$). This means that the association between PEU and ATT is transmitted, in part, through users' perceptions of the human-like characteristics of AI-powered chatbots. The indirect relationship between PEU and ITU through ANTH was also positive and significant ($M = 0.060$, $SD = 0.025$, $t = 2.361$, $p = 0.018$), supporting H4(b). This suggests that perceptions of chatbot usefulness are associated with ANTH. This perception subsequently contributes to stronger intentions to use the technology. ANTH also significantly mediated the relationships involving EOU. The indirect effect of EOU on ATT through ANTH was significant ($M = 0.039$, $SD = 0.013$, $t = 2.860$, $p = 0.004$), providing support for H4(c). Similarly, H4(d) was supported by the significant indirect relationship between EOU and ITU through ANTH ($M = 0.034$, $SD = 0.014$, t

= 2.487, p = 0.013). These findings indicate that the effects of EOU on users' attitudes and usage intentions are partly transmitted through their perceptions of ANTH.

Table 5 Indirect Effects

Hypothesis	Relationship	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Result
H4(a)	PERCEIVE USEFULNESS -> ANTHROPOMORPHISM -> ATTITUDE	0.066	0.022	3.039	0.002	Accepted
H4(b)	PERCEIVE USEFULNESS -> ANTHROPOMORPHISM -> INTENTION TO USE	0.060	0.025	2.361	0.018	Accepted
H4(c)	EASE OF USE -> ANTHROPOMORPHISM -> ATTITUDE	0.039	0.013	2.860	0.004	Accepted
H4(d)	EASE OF USE -> ANTHROPOMORPHISM -> INTENTION TO USE	0.034	0.014	2.487	0.013	Accepted

5. Discussion

The current study explores the factors associated with the adoption of ChatGPT among university students in Pakistan by applying Media Theory and the Extended Technology Acceptance Model (ETAM). The findings revealed the factors responsible for building attitudes towards AI-powered chatbots. The results of our quantitative data analysis supported the conceptualized model.

The first research question examined the factors that impact users' attitudes and intentions towards using AI. The findings indicate that students' positive attitudes are formed due to the perceived ease of use of ChatGPT for their educational needs. Past research on technology adoption and acceptance models has supported the importance of perceived usefulness in influencing users' attitudes and intentions for adopting technology (Yilmaz et al., 2023) According to past research, people are more likely to adopt a technology if it is easy to use (Davis et al., 1989). The hypothesis relating to the impact of perceived ease of use on attitudes towards ChatGPT is significant, indicating that perceived ease of use is crucial in shaping user attitudes and the adoption of ChatGPT (Wulandari et al., 2024). A study by Wu et al. (2023) emphasized that students' trust in ChatGPT affects perceived ease of use, perceived usefulness, and attitude, thus influencing their behavioral intention. This also helps them complete academic tasks in timely manner with enhanced learning. It also makes the students more informed about concepts and developments in their field of interest. Furthermore, the students' positive attitude towards the use of ChatGPT for their educational activities was recognized as the chief factor affecting the acceptance and adoption of technology (Granić & Marangunić, 2019; Tiwari et al., 2024).

According to past research, there are multiple benefits of using ChatGPT in an educational context as it is highly useful for students in aiding their assignment completion (Ansari et al., 2023), providing instantaneous responses to students' queries, and assisting them in classroom assignments by formulating accurate answers (Wadhawan et al., 2023). ChatGPT has yielded favorable results in enhancing students' learning experiences (Firat, 2023). AI applications such as ChatGPT have provided significant benefits to students by offering customized solutions to their educational needs in a convenient, accessible, and user-friendly manner (Yang & Lee, 2019).

These apps are available anytime and anywhere, allowing students to seek assistance and guidance at their convenience (Aljaber, 2021). Students can access educational resources while on the go thanks to mobile phones' mobility as platforms for AI apps (Xie et al., 2020; Yilmaz et al., 2023). The second research question, which examined how anthropomorphism influenced attitudes and intentions about the use of AI, has been addressed by the data findings. Anthropomorphism significantly affects attitude and intention to use ChatGPT, according to the study. A previous Chinese study that looked at ChatGPT's anthropomorphic traits discovered a strong favorable correlation with its use. The study also found that the association between anthropomorphism and the actual use of ChatGPT is mediated by perceived enjoyment and interaction (Wang et al., 2023). The positive relationship between anthropomorphism and user attitudes regarding ChatGPT has been repeatedly emphasized in academic publications. Users' perceptions and interactions with AI-powered chatbots are greatly influenced by anthropomorphism, which is the attribution of human-like characteristics to non-human entities. Research shows that people are more likely to adopt favorable attitudes toward utilizing a chatbot when they believe it possesses human-like traits like consciousness and interactivity (Yilmaz et al., 2023). This perspective makes the interaction feel more natural and enjoyable, which also raises user satisfaction and engagement. ChatGPT's human-like characteristics, notably its conversational style and responsiveness can foster a sense of social presence and belonging. This can leave a favorable lasting effect on users' propensity to utilize and trust it. The relationship between anthropomorphism and actual usage is further supported by findings that show perceived enjoyment and interaction modulate it, highlighting the importance of these factors in enhancing the overall user experience (Wulandari et al., 2024). The greater propensity of East Asian individuals to anthropomorphize robots acts as a partial mediator of these cultural differences. However, the use of a single item from a larger scale of anthropomorphism and a sample made up only of Canadian students limited the generalizability of the results in this exploratory study.

5.1 Implications and Future Research

Many useful recommendations and insights can be provided through this research for enhanced chatbot interfaces and experiences. Initially, by incorporating the human like elements, the user engagement towards chatbot can be increased. These human-like characteristics can be emotional expressions and understanding that give users the feel and sense of belongingness. This is well aligned with the idea that users are more prone to interacting with chatbots exhibiting human like nature and traits.

In addition to providing accurate and relevant responses, developers should be concentrating on designing user interfaces that are simple to use, intuitive and engaging. User acceptability and long-term engagement can be significantly increased by rationalization of user interactions and making sure chatbots offer real value. The application also increases students' self-assurance and enthusiasm, which leads to improved literacy and general awareness. In the end, the results of this study will help authorities monitor the use of AI-based bots and help AI developers improve their goods and services.

AI chatbots can be used in customer care to efficiently handle complex consumer inquiries by maintaining a human-like conversational style. This may improve user satisfaction and reduce the burden on human agents. By incorporating the Extended Technology Acceptance Model (ETAM), these chatbots can provide customized health recommendations. Increased user engagement and perceived utility could result from this. In the field of education, chatbots can act as personalized tutors, providing each student with specialized instruction. By using human characteristics, these educational chatbots can improve the learning environment and potentially improve student outcomes.

When technology is more interesting, engaging and compassionate, people are more likely to engage with it and have faith in it. This knowledge may be especially useful to developers and designers who wish to create chatbot interfaces that are more effective and user-friendly. The practical implications include improving the overall effectiveness of AI-powered conversational agents on various digital platforms, ensuring that these technologies are not only practical but also engaging and pertinent for users.

This study has mostly added to the body of literature though its findings. It has also pointed out areas that need further research. Since Pakistani consumers were the study's primary focus, it is also crucial to investigate how these elements might manifest in various cultural contexts. This can assist the researchers in offering a more thorough comprehension of global customer behavior.

Additionally, more in-depth study into the long-term impacts of anthropomorphism on user involvement should be conducted in future studies. Although human-like qualities might have a favorable impact on chatbot usage, but it is unclear if this effect will last over time or if users will eventually grow accustomed to preferring simpler, non-anthropomorphic interactions.

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